REMARKS

By this amendment, claim 8 is revised and arguments are presented to place the application in condition for allowance. Currently, claims 8-11, 24, and 25 are before the Examiner for consideration on their merits.

First, a free acid number is introduced into claim 8 with a range of 3.6 to 6.0. Support for this amendment is found in Table 5 so no new matter is introduced.

Second, Applicants traverse the rejection based on Boulos and Collier for three reasons. First, the allegation that there is overlap between the total and free acid numbers of Boulos and claim 8 no longer exists. Second, the combination of references is improper so that a *prima facie* case of obviousness does not exist; the proper articulated reasoning supporting the combination is missing. Third, the finding of the invention with respect to improved galling resistance is one that is a rebuttal of any allegation of obviousness.

In the Advisory Action, the Examiner asserted that Boulos taught a total acid to free acid ratio of 2.67 to 33.33 and that this ratio overlapped the claim range of 6-11. This position is not correct since it fails to take into account the free acid number of Boulos. Claim 8 is revised to define a free acid number range of 3.6 to 6.0 and this range is far afield from the upper limit of 1.5 of Boulos. Thus, there is no overlap with respect to the total acid number, the free acid number, and the total acid to free acid ratio of claim 8 and the values disclosed in Boulos. Therefore, the Examiner must either admit that a *prima facie* case of obviousness does not exist or

establish another reason why one of skill in the art would find it obvious to modify Boulos so as to meet the limitations of claim 8, as amended.

Applicants contend that there is no reason other than hindsight to modify Boulos so as to arrive at the method of claim 8, particularly with respect to the total acid, free acid, and ratio numbers. Boulos states in col. 6, lines 20-34, that the upper limit is 1.5 for the free acid number and more preferably 0.1. With this indication, one of skill in the art would not select a free acid number of 3.6 as is required in claim 8.

In addition, Boulos and the invention are not in the least related. In this regard, the Examiner's attention is directed to the arguments below regarding the absence of any connection or common aim between the invention and Boulos. With the different aim of Boulos as compared to the invention, the Examiner cannot assume that the acid numbers for the invention can be easily derived from Boulos. To say that the claimed ranges could be obtained is just speculation; there is no reason for doing so. Boulos is designed to prepare a steel substrate for painting, whereas the aim of the invention is to prepare an oil well steel pipe surface to mitigate galling. Therefore, a *prima facie* case of obviousness does not exist when considering the acid number values of claim 8.

The rejection is also flawed since the reasoning used to modify Boulos is improper. The object of the present invention is to manufacture oil well pipe. The object of Boulos is to provide a steel plate for use in automobiles. Although there is a technical overlap between the invention and Boulos with respect to the genre of

steel materials, the purpose of the coatings of Boulos and the invention are totally at odds. The purpose for the phosphate conversion coating in Boulos is to provide a substrate useful for paint coatings. In contrast, the phosphate conversion coating of the invention is intended to benefit in the areas of exhibiting resistance to galling or seizing. These purposes are totally at odds with each other. Page 1, lines 8-10, and page 5, lines 24-27, of the specification should be compared to the Abstract of Boulos to verify this point.

In formulating the rejection, the Examiner admits that Boulos does not use 0.5-13% Cr steel oil well pipe as part of the phosphate conversion process. Nevertheless, the Examiner concludes that one of skill in the art would have applied the process of Boulos to a 0.5-13% Cr steel oil well pipe with an expectation of success since the claimed Cr-containing steel is also a steel that would be suitable for use in the process of Boulos and that Collier teaches phosphate coating of oil well pipes.

The Examiner's reasoning draws the conclusion that the purpose and function of providing a phosphate chemical conversion film on a substrate in Boulos is the same as the film formation of the invention on a 0.5-13% Cr steel oil well pipe. This conclusion is not supported by any objective facts. The Examiner uses the term "suitable" to justify the conclusion of obviousness. However, Boulos does not speak of pipe made of 0.5-13% Cr steel when identifying the material suitable for his process. To the contrary, Boulos broadly speaks of ferrous metals, and zinc-containing materials, and the desire to produce a quality undercoat for paint, see

col. 1, line 14-23. Therefore, Boulos does provide any reasoning why the Boulos process should be used on steel oil well pipe containing 0.5-13% Cr.

The Examiner attempts to support the modification of Boulos using the teachings of Collier. Applicants submit that the rejection is in error on the grounds that the Examiner draws a conclusion of obviousness without the proper reasoning and improperly interprets Collier. The mere fact that 0.5-13% Cr steel oil well steel pipes are known is not justification to say that the process of Boulos can be used on these pipes. The artisan must have some reason to take the process of Boulos, which is designed to produce an undercoat for paint applications, and use it on a material that would have no paint application need or requirement, i.e., 0.5-13% Cr steel oil well pipe.

Collier does not supply the reasoning to modify Boulos. Collier is concerned with using silica products for their corrosion resistance or adhesion promotion as a precursor to an organic coating. One embodiment involves using the silica products in combination with a phosphating treatment, whereby a suitable amount of the salt of the trivalent metal and silica are in the phosphating bath. The phosphated material is then organically coated, see col. 7, lines 10-15.

The Examiner also cites col. 8, lines 22-24, of Collier to say that Collier coats oil pipes and this means that the chemical conversion coating of Boulos is equally applicable to oil well pipes.

The problem with the reasoning used in the rejection is that the Examiner has misinterpreted Collier and the reasoning used in the rejection is not factually supported.

1) The Examiner is saying that it would be obvious to use the Boulos process on oil pipes because Collier treats oil well pipes using a phosphate chemical conversion.

2) Boulos uses a very particular phosphate chemical conversion process as a pretreatment for paint application. This process requires a precise concentration of manganese cations, a precise concentration of phosphate anions, and nitric acid, temperature control, free acid points value control and total acid points value control, and control of the concentration of other ions as detailed in claim 1.

2) Collier's teachings relate to a treatment using silica in a phosphate conversion process as a prelude to an organic coating process and this process is not the same as that taught by Boulos. What Collier really teaches is the application of a coating consisting of an acidic trivalent metal compound, in which the metal is iron or aluminum or a mixture thereof and dispersed silica with a particular atom ratio of silicon to the trivalent metal to produce a coated surface. Collier teaches that one way to apply this coating is to use a phosphating bath. Collier **does not** teach the phosphate chemical conversion film coating of 0.5-13r% Cr steel oil well pipe by itself or without the silica

coating. Further, Collier exemplifies mild steel panels or aluminum panels and does not suggest the use of a steel alloy oil well pipe.

3. Based on the fact that Collier does not teach the application of just a phosphate chemical conversion coating on a 0.5-13% Cr-containing steel oil well pipe, the Examiner's interpretation of Collier on the top of page 4 of the final rejection is in error. The Examiner cannot say that Collier provides a reason to use the process of Boulos on 0.5-13r% Cr steel oil well pipe when Collier does not teach the plain chemical conversion film coating of 0.5-13% Cr oil well pipe.

The Examiner could say that one of skill in the art would apply the specific process of Collier to a 0.5-13% Cr steel pipe. However, the specific process of Collier is not the same as that employed in the invention to improve galling and using the process of Collier on 0.5-13% Cr steel pipe does not meet the claim limitations of claim 8. The failings in the teachings of Collier means that the Examiner lacks a reason to use the process of Boulos in the alleged manner, and a *prima facie* case of obviousness is not established based on the teachings of Boulos and Collier.

In direct opposition to Boulos, the invention is concerned with improving the resistance to galling for a steel oil well pipe containing 0.5-13% Cr. In the past, a soft metal plating layer was provided so as to improve resistance to galling of oil well pipes of a Cr-containing steel, see page 2, lines 15-18 of the specification. This

approach however was problematic and better ways to attain galling resistance were needed.

The inventors had the idea that the provision of a chemical conversion film on the steel substrate of pipes would be a better solution to the problem of galling. However, the inventors found out that it was quite difficult to form a chemical conversion film on such a 0.5-13% Cr-containing steel substrate due to adhesion problems. Solving this problem is the specific aim of the present invention, i.e., improve the adhesion of a phosphate chemical conversion film onto a steel oil well pipe containing 0.5 to 13% Cr.

Boulos does not in the least recognize the difficulty in forming these types of films let alone propose a solution thereto. One reason for this is that Boulos teaches the addition of potassium in a chemical conversion liquid to adjust the acidity of the liquid, see col. 8, lines 59-61. There is no recognition that the presence of potassium would improve the adherence of the phosphate film coating on the claimed 0.5-13% Cr steel oil well pipe. In the invention, the presence of potassium promotes the nucleation for formation of a phosphate film and because of this, the difficult-to-film-coat 0.5-13% Cr steel oil well pipe could be satisfactorily coated and galling resistance is vastly improved.

What Applicants are arguing here is that an **unexpected benefit occurs** when performing chemical conversion treatment on an oil well pipe having a steel composition containing 0.5 – 13% Cr using a chemical conversion treatment liquid containing zinc and phosphoric acid or manganese and phosphoric acid and further

containing potassium to form a chemical conversion film of a zinc-phosphate type or a manganese phosphate type, wherein the chemical conversion treatment is carried out in the absence of fluoride ions and further wherein a total acid number of the chemical conversion treatment liquid is at least 30 and less than 55, a free acid number is 3.6 to 6, and a ratio of the total acid number to the free acid number is 6 to 11.

The alleged obvious change to Boulos is to take the Boulos process and use it on oil well pipe having a steel composition containing 0.5 – 13% Cr. Even if this were obvious, **the finding that the problems in forming a conversion film on oil well pipe having a steel composition containing 0.5 – 13% Cr is alleviated by using the specifically claimed chemical conversion treatment liquid are overcome is an UNEXPECTED finding that is a rebuttal to the allegation of obviousness.**

To summarize, the rejection is flawed for three reasons. First, an overlap no longer exists based on the free acid and total acid values of claim 8 and a *prima facie* case of obviousness cannot exist for this reason. Second, the interpretation of Collier is overly broad and, in fact, Collier does not stand for the proposition that it is known to use chemical conversion to treat 0.5-13% Cr steel oil well pipe. Third, any allegation of obviousness is rebutted by the finding that when the claimed phosphating process is used to treat 0.5-13% Cr steel oil well pipe, unexpected improvements in galling resistance are realized.

In light of the above, the Examiner is respectfully requested to examine this application and pass all pending claims onto issuance.

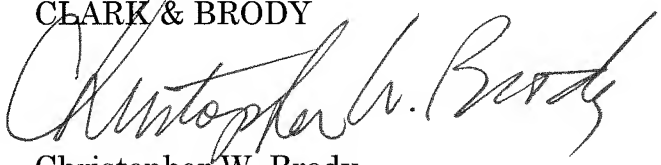
If the Examiner believes that an interview would be helpful in expediting the allowance of this application, the Examiner is requested to telephone the undersigned at 202-835-1753.

Again, reconsideration and allowance of this application is respectfully requested.

A petition for a three month extension of time is made. Please charge Deposit Account No. 50-1088 the amount of $980.00 to cover the cost of the extension of time, as a one month extension of time fee was paid on March 5, 2010..

Please charge any fee deficiency or credit any overpayment to Deposit Account No. 50-1088.

Respectfully submitted,
CLARK & BRODY



Christopher W. Brody
Reg. No. 33,613

Customer No. 22902
1700 Diagonal Road #510
Alexandria, VA 22314

Telephone: 202-835-1111
Docket No.: 12014-0010DV
Date: April 27, 2010